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Docket No.: AP01949
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Judith L. GARDNER et al.

Application No.: 09/976,989

Confirmation No.: 3346

Filed: October 12, 2001

Art Unit: 3661

For: METHOD AND APPARATUS FOR
IMPROVING VEHICLE OPERATOR
PERFORMANCE

Examiner: Brian J. Boadhead

AMENDED APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicants file this Amended Appeal Brief in accordance with 37 C.F.R. § 41.37(d) as required by the Notification of Non-Compliant Appeal Brief mailed February 3, 2006.

This Amended Appeal Brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

- I. Real Party In Interest
- II. Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments
- V. Summary of Claimed Subject Matter
- VI. Issues to be Reviewed on Appeal
- VII. Argument
- VIII. Appendix A – Claims
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I. Real Party In Interest

The real party in interest is Motorola, Inc. the assignee of the above-identified patent application. The assignment assigning rights to Motorola, Inc., is recorded in the United States Patent and Trademark Office ("USPTO") at Frame 014230 of Reel 0793.

II. Related Appeals and Interferences

There are no related appeals or interferences.

III. Status of Claims

Currently, claims 1-41 are pending in the application. The pending claims are presented in Appendix A to this Brief. Claims 1-41 stand rejected and form the subject matter of this appeal

A. History

The application was originally filed on October 12, 2001, with claims 1-39. Claims 40 and 41 were added by amendment dated March 17, 2004.

B. Current Status of Claims

1. Claims canceled: None
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-41
4. Claims allowed: None
5. Claims rejected: 1-41

C. Claims on Appeal: 1-41

IV. Status of Amendments

No amendments have been filed since the Final Office Action dated November 12, 2004.

V. Summary of Claimed Subject Matter

The present application relates to a method of and apparatus for improving driver performance through performance feedback. Claim 1 recites a method including receiving

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vehicle operating data from the vehicle relating to the vehicle operating condition (p. 19, l. 9 – p. 20, l. 11; p. 21, ll. 1-15; p. 22, l. 22 – p. 23, l.3); monitoring an interior portion of the vehicle and receiving operator activity data from the interior portion of the vehicle relating to activities of the operator within the interior portion (p. 20, ll. 12-19; p. 21, ll. 16-23; p. 23, ll. 4-11); receiving vehicle environment data from the environment external to the vehicle (p. 20, ll. 20-24; p. 21, ll. 24-28; p. 23, ll. 12-16); monitoring the vehicle operator and receiving operator condition data relating to a condition of the vehicle operator (p. 20, ll. 25-28; p. 21, ll. 29-32; p. 23, ll. 17-20); and recording an operator performance assessment based on the vehicle operating data, the operator activity data, the vehicle environment data and the operator condition data, the operator performance assessment being a score assessing the ability of the operator to operate the vehicle relative to known good practices and reporting the operator performance assessment to the operator for improving driving performance (p. 11, l. 25 – p. 15, l. 4; p. 20, ll. 29-34; p. 21, l. 33 – p. 22, l. 2; p. 23, ll. 21-28).

Claim 2, dependent on claim 1, recites a method including reporting the operator performance assessment upon conclusion of vehicle operation (p. 14, ll. 22-30).

Claim 31 recites an apparatus comprising a sensor fusion module, the sensor fusion module being coupled to a vehicle condition sensor, a vehicle exterior sensor, an operator condition sensor and an operator activity sensor respectively providing to the sensor fusion module vehicle condition data, vehicle environment data, operator condition data and operator activity data, the sensor fusion module operable to provide a master condition list based on the data received by the sensor fusion module (p. 6, l. 22 – p. 8, l. 5); a response selector coupled to the sensor fusion module, the response selector being operable to determine a current operating condition based upon the master condition list and to assess an operator action in response to the current operating condition to provide an operator performance assessment value based upon the master condition list and the operator action, the operator performance assessment value being a score assessing the ability of the operator to operate the vehicle relative to known good practices (p. 11, l. 25 – p. 12, l. 33); and an action generator coupled to the response selector to generate a feedback message based upon the operator performance assessment value to the operator relating to improving performance (p. 13, ll. 1-7).

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Claim 23, dependent up claims 1 and 21, includes monitoring a physical condition of the driver, wherein the physical condition of the driver is intoxication (p. 20, ll. 25-28; p. 21, ll. 29-32; p. 23, ll. 17-20).

Claim 40, dependent upon claim 31, recites an apparatus wherein known good practices comprises information on driving performance of a normal population, previously identified good driving performance or good habitual driving behavior (p. 3, ll. 18-27; p. 5, l. 30 – p. 6, l. 6; p. 8, ll. 3-5).

V. Issues To Be Reviewed On Appeal

The issues presented on appeal are:

Whether Kubota et al. (U.S. Patent No. 6,249,720) recite each an every limitation of claims 1 and 31, and in particular, an operator performance assessment being a score assessing the ability of an operator to operate a vehicle relative to known good practices;

Whether the combination of the references Kubota in view of McMillan et al. (U.S. Patent No. 5,797,134) and Lemelson et al. (U.S. Patent No. 6,487,500) teach or suggest assessing vehicle operator performance based on known good practices as recited in claims 2 and claim 23; and

Whether claim 40 has written description support under 35 U.S.C. § 112, first paragraph, and in particular, whether the written description supports the claim limitation “previously identified good driving performance or good habitual driving behavior.”

VII. Argument

a. Claims 1, 3-22, 24-37, 40 and 41 are patentable over Kubota.

Each of claims 1-41 recites an operator performance assessment being a score assessing the ability of an operator to operate a vehicle relative to known good practices. The cited reference of Kubota does not disclose any consideration of known good practices because Kubota does not disclose any qualitative or objective measurement of driving performance. Despite applicants numerous attempts to highlight this qualitative and objective aspect of known good practices, the Examiner appears intent on dismissing this aspect of the claims by arguing elements of Kubota that do not relate to qualitative or objective standards of performance.

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Determining driver performance based on known good practices requires analyzing various sensor data to determine a driving maneuver and analyzing a driver's operation of the vehicle during the maneuver against an accepted good practice standard. For example, recording steering angle, velocity, and brake application alone cannot determine whether or not a driver made a "good" turn in wet driving conditions. In order to assess driver performance, the vehicle operating data must be interpreted to determine the maneuver the driver is attempting, e.g., a 100 degree turn in wet surface conditions. The driver's actual application of steering, brake and accelerator, etc., used to accomplish the turn in wet surface conditions is then compared to the application of steering, brake and accelerator, etc., made by good drivers in order to assess driving performance. Kubota does not disclose or even suggest that any objective standard is applied to a driver's operating data.

Kubota discloses an animated agent that reacts by falling when brake pressure is applied (see Examiner's reference to Kubota col. 9 lines 8-27). Kubota discloses that the level of exaggeration of the animated agent is directly related to the frequency of brake application. (See Kubota col. 9 lines 8-27). Kubota further teaches that the exaggeration of its agent is adjusted from falling on "his or her behind" to taking "several steps back" to keeping "his or her foot[ing]" (See Kubota col. 9, lines 15-20), so that the agent will eventually not react to brake application that is consistent with a driver's own average frequency and magnitude of brake application. (See Kubota col. 9, lines 20-22, stating that "such program represents that the agent becomes experienced and accustomed to the driver's sudden braking operation.") Therefore, Kubota discloses an animated agent that only indicates, via a level of exaggeration, a driver's off-average brake application.

The Examiner insists that the agent's gestures, such as the falling down of the animated character, indicates driver performance that considers known good practice. While this character gesturing indicates frequency of control application (such as braking), Kubota does not disclose, in any manner, that this frequency or change in frequency relates to a qualitative assessment of driver performance. Kubota does not consider whether the normal brake pressure of the driver is appropriate for the driving situation relative to an objective driving standard or whether a driver's off-average brake application is appropriate for a driving situation. At best, this character gesturing provides an indication of an operational characteristic of the vehicle, much like an indicator light on a dashboard shows the angle of the steering wheel, the gear position of the transmission, or the abruptness of braking (e.g., an

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Antilock Brake System light). This gesturing, however, does not indicate the quality of the driver's operation based on known good practices because Kubota fails to teach how the frequency of control application is in anyway related to a measure of good or bad driving. For example, if a driver was recorded by the Kubota system to brake heavily 10 times per day (on average) and on a particular day, the driver braked heavily 15 times, Kubota teaches that the character gesturing may change to indicate this. Through this indication, a driver may realize that he has been braking heavily more often than his average. However, Kubota does not teach whether the driver's average indicates good or bad driving or whether the change from the average indicates good or bad driving.

In fact, Kubota may actually teach away from the recited known good driving practices. A falling down gesture made when strong brake pressure is applied may be interpreted as an undesired effect, when the situation, according to known good practices, requires strong braking to avoid a collision. In some situations, sudden braking may actually be a positive performance factor based on known good practices, such as when sudden braking is in response to an unexpected road hazard. If sudden braking can indeed be a positive performance assessment based on known good practices, then the Examiner has failed to prove that Kubota inherently discloses a performance indicator of known good practice, and thus, Kubota cannot teach the element of known good practice. At best, Kubota teaches that the agent's reaction may coincide, by happenstance, with an instance of bad driving, (e.g., when a situation does not require, according to known good practice, sudden braking) but this is not sufficient to indicate that Kubota's agent teaches driver performance based on a consideration of known good practices.

Moreover, Kubota only discloses an indication of a driver's off-average driving based on that driver's own past driving record. Using Kubota's disclosed system, there is no way to objectively qualify a driver's performance because Kubota does not disclose any standard for comparison except for a driver's own driving history. There may be times when a bona fide good driver may operate a vehicle using the Kubota system, in which case known good practices may be incorporated into that driver's own past driving performance or habitual driving behavior. However, in order for a driver's own past driving performance or habitual driving behavior to relate to known good practices, the driver's performance must first be qualified against a practice standard rated against good drivers. (This is explained on page 14 of the specification) Kubota does not disclose this, in any manner.

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The Examiner asserts (in the last office action) that Kubota discloses consideration of average brake application, and thus considers habitual behavior. The Examiner further asserts that claims 40 and 41 illustrate that "habitual behavior is considered a known good practice," and thus, that the claims are non-novel. The Examiner incorrectly reads into the claims an equivocation of known good driving practices with habitual driving behavior. As recited by claims 40 and 41, habitual behavior may be one factor among others that is considered in determining known good practices. While it is true that claim 40 recites that known good practices comprises information on good habitual driving behavior, this is different from reciting that good habitual behavior is equivalent to known good practices. Habitual behavior alone is not equivalent to known good practices, but may be considered along with other factors in determining known good practiced. By taking into consideration a number of factors including habitual behavior, the claimed system can determine whether a driver's performance is good or bad. While Kubota discloses considering a driver's average brake application, Kubota does not disclose assessing performance based on known good practice.

Known good practice and performance are quality measures which rely on an objective standard. Kubota never discloses a quality factor or an objective standard. Kubota discloses an animated agent that provides an indicator of operational functions being executed by a driver. At best, these indicators provide information on the frequency of vehicle control usage and the force applied to the vehicle from these controls. Again, these indicators do not convey a measure of the quality of driver operation. Therefore, the pending claims are patentable over Kubota cannot anticipate any of the pending claims.

b. Claims 2 and 23 are patentable over Kubota in view of McMillan et al. and over Kubota in view of Lemelson et al.

Applicants assert claim 2 is patentable over Kubota in view of McMillan et al. (U.S. Patent No. 5,797,134) and claim 23 is patentable over Kubota in view of Lemelson et al. (U.S. Patent No. 6,487,500). Neither McMillan nor Lemelson discloses or teaches assessing vehicle operator performance based on known good practices. Instead, McMillan discloses an apparatus for monitoring, recording, and communicating vehicle driving data for determining the insurance cost of a driver. No determination of driver performance is made based on known good practices. Moreover, while Lemelson discloses determining driver

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intoxication, Lemelson does not disclose determination of driver performance based on known good practices. Therefore, no combination of Kubota, McMillan and Kubota can render the pending claims obvious.

c. Claim 40 is supported by the specification.

Applicants assert there is sufficient written description support under 35 U.S.C. § 112, first paragraph, for the limitations "identified good" driving performance, and "good" habitual behavior as set forth in claim 40. Page 13, last full paragraph, clearly discusses using "known good habits" and past performance in assessing how smoothly the driver is braking and/or accelerating. Moreover, because the phrase "known good practice" is described as a quality measurement in the specification, any limitations on known good practice, such as the use of "identified good" and "good" in claim 40, is imputed with a characteristic quality of "known" and "good." In other words, known good practice imputes a limitation of "known" and "good" onto the phrases that comprise it, and thus whether "habitual behavior" or "previous driving" is recited as a limitation, a modifier such as "good" or "identified good" pre-fixed to the limitation is implied. It follows that the rejection of claim 40 for being indefinite is improper and must be withdrawn.

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VIII. Claims Appendix

See attached Appendix – A.

IX. Evidence Appendix

This brief does not contain an Evidence Appendix.


X. Related Proceedings Appendix

There are no related decisions rendered by a court or the Board in any proceeding identified in Section II, above.

Respectfully submitted,

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March 23, 2006

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APPENDIX A**Claims Involved in the Appeal of Application Serial No. 09/976,989**

1. (Previously Presented) A method of improving driver performance through performance feedback; the method comprising the steps of:
receiving vehicle operating data from the vehicle relating to the vehicle operating condition;
monitoring an interior portion of the vehicle and receiving operator activity data from the interior portion of the vehicle relating to activities of the operator within the interior portion;
receiving vehicle environment data from the environment external to the vehicle;
monitoring the vehicle operator and receiving operator condition data relating to a condition of the vehicle operator;
recording an operator performance assessment based on the vehicle operating data, the operator activity data, the vehicle environment data and the operator condition data, the operator performance assessment being a score assessing the ability of the operator to operate the vehicle relative to known good practices; and
reporting the operator performance assessment to the operator for improving driving performance.
2. (Original) The method of claim 1 wherein the step of reporting the operator performance assessment comprises reporting the operator performance assessment upon conclusion of vehicle operation.
3. (Original) The method of claim 1 wherein the step of reporting the operator performance assessment comprises reporting the operator performance assessment during operation of the vehicle.
4. (Original) The method of claim 1 further comprising recording a first operator performance assessment relating to a first period of vehicle operation and recording a second operator performance assessment relating to a second period of vehicle operation

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and comparing the first operator performance assessment and the second operator performance assessment.

5. (Previously Presented) The method of claim 1 further comprising the step of receiving operator preference data, and wherein the step of recording an operator performance assessment comprises recording an operator performance assessment based on the operator preference data.

6. (Original) The method of claim 1 wherein the operator performance assessment is representative of operator skill.

7. (Original) The method of claim 1 wherein the operator performance assessment comprises a score for each of a plurality of aspects of vehicle operation.

8. (Previously Presented) The method of claim 1 wherein the step of reporting the operator performance assessment comprises providing at least one of a visual indication, audio indication and a haptic indication.

9. (Original) The method of claim 1 wherein the step of receiving data from the vehicle relating to the vehicle operating condition comprises receiving data relating to at least one of: vehicle speed and vehicle acceleration.

10. (Original) The method of claim 1 wherein the step of receiving data from the vehicle relating to the vehicle operating condition comprises receiving data relating to at least one of: throttle application, brake application and steering wheel input.

11. (Original) The method of claim 10 wherein throttle application comprises at least one of throttle position, rate of change of throttle position, additional available throttle input and throttle applicator pressure.

12. (Original) The method of claim 10 wherein the brake pressure application comprises at least one of brake position, rate of change of brake position, additional available brake input and brake applicator pressure.

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13. (Original) The method of claim 10 wherein the steering wheel input comprises at least one of steering wheel position, rate of change of steering wheel, operator pressure applied to the steering wheel and additional available steering input.

14. (Original) The method of claim 1 wherein the step of receiving data from the vehicle relating to the vehicle operating condition comprises receiving data relating to an operating parameter of the vehicle.

15. (Original) The method of claim 1 wherein the step of monitoring an interior portion of the vehicle comprises monitoring the usage of vehicle system controls by the operator.

16. (Original) The method of claim 1 wherein the vehicle system controls comprise driving controls.

17. (Original) The method of claim 1 wherein the vehicle system controls comprise telematics controls.

18. (Original) The method of claim 1 wherein the vehicle system controls comprise occupant comfort controls.

19. (Original) The method of claim 1 wherein the vehicle system controls comprise infotainment controls.

20. (Original) The method of claim 1 wherein the vehicle system controls comprise communication controls.

21. (Original) The method of claim 1 wherein the step of monitoring the vehicle operator comprises monitoring a physical condition of the vehicle operator.

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22. (Original) The method of claim 21 wherein the physical condition comprises fatigue.

23. (Original) The method of claim 21 wherein the physical condition comprises intoxication.

24. (Original) The method of claim 1 wherein the step of monitoring the vehicle operator comprises monitoring a psychological condition of the operator.

25. (Original) The method of claim 1 wherein the step of monitoring an interior portion of the vehicle comprises monitoring a distraction condition of the operator.

26. (Original) The method of claim 1 wherein the step of monitoring an interior portion of the vehicle comprises monitoring vehicle passengers.

27. (Original) The method of claim 1 wherein the step of receiving data from the environment comprises receiving road condition data.

28. (Original) The method of claim 1 wherein the step of receiving data from the environment comprises receiving lane following data.

29. (Original) The method of claim 1 wherein the step of receiving data from the environment comprises receiving headway data.

30. (Original) The method of claim 1 wherein the step of receiving data from the environment comprises receiving traffic data.

31. (Previously Presented) An apparatus for improving vehicle operator performance, the apparatus comprising:

a sensor fusion module, the sensor fusion module being coupled to a vehicle condition sensor, a vehicle exterior sensor, an operator condition sensor and an operator activity sensor respectively providing to the sensor fusion module vehicle condition data, vehicle environment data, operator condition data and operator activity data, the sensor fusion

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module operable to provide a master condition list based on the data received by the sensor fusion module;

a response selector coupled to the sensor fusion module, the response selector being operable to determine a current operating condition based upon the master condition list and to assess an operator action in response to the current operating condition to provide an operator performance assessment value based upon the master condition list and the operator action, the operator performance assessment value being a score assessing the ability of the operator to operate the vehicle relative to known good practices; and

an action generator coupled to the response selector to generate a feedback message based upon the operator performance assessment value to the operator relating to improving performance.

32. (Original) The apparatus of claim 31 wherein the vehicle condition data comprises at least one of: vehicle speed, vehicle acceleration, throttle application, brake application, steering wheel input, throttle position, rate of change of throttle position, rate of change of throttle position, additional available throttle input, throttle applicator pressure, brake position, rate of change of brake position, additional available brake input, brake applicator pressure, steering wheel position, rate of change of steering wheel position, operator pressure applied to the steering wheel and additional available steering input.

33. (Original) The apparatus of claim 31 wherein the operator activity data comprises usage data relating to at least one of driving controls, telematics controls, occupant comfort controls, infotainment controls and communication controls.

34. (Previously Presented) The apparatus of claim 31 wherein the operator condition data comprises data relating to at least one of fatigue, intoxication and distraction.

35. (Original) The apparatus of claim 31 wherein the vehicle environment data comprises data relating to at least one of road condition, lane following, headway, traffic control and traffic condition.

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36. (Original) The apparatus of claim 31 wherein the operator performance assessment value comprises an inference value.

37. (Original) The apparatus of claim 31 wherein the vehicle exterior sensor comprises at least one of radar, laser, video and sonar.

38. (Original) The apparatus of claim 31 wherein the operator activity sensor comprises video.

39. (Previously Presented) The apparatus of claim 31 wherein the feedback message comprises a prerecorded message.

40. (Previously Presented) The apparatus of claim 31, wherein known good practices comprises information on driving performance of a normal population, previously identified good driving performance or good habitual driving behavior.

41. (Previously Presented) The method of claim 1, wherein known good practices comprises information on driving performance of a normal population, previous driving performance and habitual behavior.